DOI: 10.1377/hlthaff.2020.01796 HEALTH AFFAIRS 40, NO. 5 (2021): 820-828 ©2021 Project HOPE— The People-to-People Health Foundation, Inc. By Richard E. Nelson, Ann Elizabeth Montgomery, Ying Suo, James Cook, Warren Pettey, Adi Gundlapalli, Tom Greene, William Evans, Lillian Gelberg, Stefan G. Kertesz, Jack Tsai, and Thomas H. Byrne

Temporary Financial Assistance Decreased Health Care Costs For Veterans Experiencing Housing Instability

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omelessness is associated with a myriad of negative health consequences including higher rates of infectious diseases, age-related conditions, poorly controlled chronic conditions, and neuropsychiatric disorders. In addition, compared with housed people, those experiencing homelessness have longer and more expensive inpatient stays as well as more frequent emergency department (ED) visits.

Housing interventions have been shown to improve both physical⁷ and mental^{8,9} health outcomes and could reduce health care costs as well. A recent study found that veterans who experienced brief homelessness episodes incurred approximately \$7,500 less in health care costs each year than those with ongoing episodes.¹⁰ Also, a recent meta-analysis found that the implementation of a Housing First model was associated with reductions in inpatient hospitalizations and ED visits among people experiencing home-

lessness.11

The high social costs of homelessness have led many homeless policy advocates to suggest that programs that increase housing stability may have a fiscal dividend as well. ^{12,13} Unfortunately, the results for this claim are far from conclusive. ^{11,14} The few economic evaluations of homelessness interventions have focused almost exclusively on permanent supportive housing. To our knowledge, no studies exist assessing the impact of short-term rental subsidies for unstably housed people on health care costs, despite the proliferation of such forms of assistance during the past decade.

In October 2011 the Department of Veterans Affairs (VA) launched the Supportive Services for Veteran Families (SSVF) program as a partnership with community nonprofit organizations—known as grantees—to provide housing support and services to veterans who are either literally homeless or at risk of becoming homeless. One of the services provided through this

program is temporary financial assistance, which can be used to pay rent, utility payments, security deposits, and other housing-related expenses. The explicit goal of this temporary financial assistance is to prevent homelessness or to quickly house people who have become homeless. Recent work suggests that it reduces the risk for homelessness in the general population¹⁵ and in the SSVF population in particular.¹⁶

In this article we assess whether there may be important secondary effects of this intervention by examining health care costs before and after people enrolled in SSVF. Not all participants receive temporary financial assistance, so non-recipients form a natural comparison group. We examine data on costs for VA health care encounters for eight quarters before and after enrollment in SSVF and compare outcomes for people who do and do not receive temporary financial assistance.

Study Data And Methods

SETTINGS The VA awards grants to communitybased nonprofit organizations to administer the Supportive Services for Veteran Families program, which has two components: rapid rehousing, intended for veteran households that have recently lost stable and permanent housing, and homelessness prevention, which supports veteran households that are at imminent risk of becoming homeless. Grantees may provide a variety of services that they tailor to the needs of each household, including the following: outreach to the community and within the VA, case management, assistance obtaining VA benefits, assistance support such as Temporary Assistance for Needy Families (TANF) and the Supplemental Nutrition Assistance Program (SNAP), and temporary financial assistance. The latter may include assistance with rent, utility payments, security deposits, moving expenses, child care, and transportation. As of fiscal year 2018, SSVF had funded 308 grantees in all 50 states, with expenditures reaching \$333 million. During FY 2018 SSVF served 83,343 households, and more than 500,000 households have received benefits since its inception.17

STUDY DESIGN AND POPULATION Using a historical cohort study design, we constructed a data set of all SSVF episodes occurring between fiscal years 2016 and 2018. To ensure that we used the most reliable episode-level temporary financial assistance data, we used procedures described in our previous study.¹⁶

For our analysis, we constructed a panel data set with one observation per veteran-quarter spanning the eight quarters before and the eight quarters after the SSVF episode entry date.

DATA We identified episodes of services from the SSVF administrative data, which are captured in Homeless Management Information Systems. These systems use a standard format established by the Department of Housing and Urban Development (HUD) for collecting information about persons accessing homeless assistance systems. The Homeless Management Information Systems data collected by SSVF are episode-level data that track dates of entry into and exit from the program and include information about patients' demographic characteristics, employment and education status, receipt of temporary financial assistance, and receipt of other social benefit programs. We used data from the VA Homeless Operations Management and Evaluation System to assess veterans' enrollment in VA homeless programs other than SSVF. The VA Corporate Data Warehouse provided information about veterans' comorbid conditions, and the VA Managerial Cost Accounting System data provided data regarding health care costs.

STATISTICAL ANALYSIS We assessed the effect of temporary financial assistance on health care costs, using a difference-in-differences approach with a multivariable mixed effects linear regression model with random effects for veteran and quarter. Veterans enrolled in SSVF who did not receive temporary financial assistance received a mix of other SSVF services including outreach, case management services, assistance obtaining VA benefits, and assistance obtaining other public benefits available in the grantee's local community. Each analysis was run for our overall cohort and then separately for the subsets of veterans whose SSVF episode used the rapid rehousing component of the program and those whose episode used the homelessness prevention component. In addition, as a robustness check, we specified an alternative model with fixed effects for each veteran and quarter rather than random effects.

OUTCOME Our study outcomes were direct medical costs of health care encounters in the VA health care system. We separately analyzed outpatient, inpatient, and total costs. Costs were converted to 2019 US dollars using the Consumer Price Index.

INDEPENDENT VARIABLES Our primary difference-in-differences analysis used three key independent variables: an indicator for veterans who received temporary financial assistance during their SSVF episode, an indicator variable for quarters after entry into the program, and the interaction between these two variables. In our secondary difference-in-differences analysis we expanded the temporary financial assistance indicator variable to be a categorical variable representing the amount of assistance received

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(\$0,\$1 to <\$2,000,\$2,000 to <\$4,000,\$4,000 to <\$6,000, or \$6,000 or more), as well as indicators for the type of temporary financial assistance (rent; security deposits; utilities; and all other, which included moving expenses, transportation, child care, and other benefits). As in our primary analysis, we then created interaction terms between these variables and the indicator for quarters after entry into the SSVF program.

Because the decision to provide temporary financial assistance to SSVF enrollees is not random, our estimates of the relationship between this assistance and health care costs may be biased by veterans' characteristics that may influence both whether the grantee provided temporary financial assistance to the veteran and that veteran's health care costs. The differencein-differences methodology removed permanent differences across enrollees that could confound the estimates of the treatment. Likewise, we included a number of additional independent variables in our regression models to minimize this confounding. Demographic variables included age, sex, presence of spouse or partner, number of children, and race. Variables describing the veteran's socioeconomic status included total monthly income, education, employment, and number of times the veteran was homeless in the previous three years. Indicators of income sources include earned, unemployment, Supplemental Security Income, VA disability (service-connected), disability VA service-connected), private disability, and workers' compensation. Indicators for publicly funded benefit programs included SNAP; Special Supplemental Nutrition Program for Women, Infants, and Children; TANF; and other benefits. Health insurance variables included Medicaid, Medicare, Children's Health Insurance Program, VA health care, employer-provided insurance, Consolidated Omnibus Budget Reconciliation Act (COBRA) continuation insurance, private pay, non-Medicaid state health insurance, Indian Health Service, and other health insurance. We also included indicator variables for enrollment in the following VA homeless programs: HUD-VA Supportive Housing, Grant and Per Diem Program, Compensated Work Therapy, Domiciliary Care for Homeless Veterans Program, Health Care for Homeless Veterans (HCHV)-Contract Emergency Residential Services Program, HCHV Low Demand Safe Haven, HCHV Case Management Program, Health Care for Re-Entry Veterans, and Veterans Justice Outreach Program. Additional independent variables included the Charlson Comorbidity Index, rurality, and fiscal year of the SSVF episode. Finally, we included indicators for other SSVF ser-

These effects on the health care sector are only a small portion of the potential benefits of programs to reduce homelessness.

vices received, the ZIP code Area Deprivation Index, ^{18,19} and an indicator for the grantee that administered the SSVF episode.

LIMITATIONS Our study had several limitations. First, our study population included US veterans accessing a specific VA homeless program, but the veteran and general US populations differ. Further, the SSVF program provides a unique intervention within a national system, which may make it difficult to generalize these results to other groups of homeless people. Recent research suggests that VA enrollees are similar to Medicare enrollees in terms of observable characteristics; however, VA enrollees are quite different from those in the Medicaid and private insurance populations.²⁰

Second, the health care cost outcomes presented here measure only the costs associated with encounters in the VA health care system. It is relatively common for veterans to obtain care from non-VA facilities, the costs of which were not included in our analysis. Third, the Homeless Management Information Systems and VA data include many veteran characteristics that influence both receipt of temporary financial assistance and VA health care costs, which we included in our multivariable regression model to reduce the effects of confounding bias; however, despite our best efforts, some residual confounding may remain as a result of the exclusion of important, unmeasured confounders. This means that our effect estimates may still be biased because of these unmeasured confounders. In addition, Homeless Management Information Systems data are largely selfreported, which may compromise their accuracy.

Study Results

Exhibit 1 shows summary statistics for our overall cohort (N = 41,969) as well as the subsets that enrolled in the rapid rehousing (n = 26,683) and homelessness prevention (n = 13,186) compo-

Descriptive statistics of the study cohort of veterans enrolled in Supportive Services for Veteran Families (SSVF)

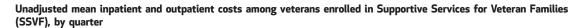
Characteristics	Overall (N = 41,969)	Rapid rehousing only $(n = 26,683)$	Homelessness prevention only (n = 13,186)
Age (mean years)	50.3	13.0	13.1
Female (%)	12.73	10.37	17.21
Has spouse or partner (%)	18.22	13.80	27.30
Has children (%)	21.69	15.68	33.82
Race (%) White African American	55.49 43.13	57.05 41.46	52.97 46.03
Total monthly income = $$0 (\%)$	30.43	31.55	28.22
Less than high school education (%)	49.68	44.75	52.28
Homeless in past 3 years (%)	38.44	16.95	83.78
Income type (%) Earned SSI VA disability	17.52 12.48 30.90	15.61 13.34 29.88	21.05 10.88 32.74
Public benefits (%) SNAP Other benefits	36.27 4.06	34.79 4.23	38.44 4.13
Health insurance (%) Medicaid Medicare VA medical services	15.47 8.59 75.54	15.96 9.05 75.67	15.21 7.84 75.42
VA homeless programs (%) HUD-VASH GPD	17.93 11.04	23.13 15.85	6.75 1.80
Charlson Comorbidity Index (mean)	2.0	2.0	1.9
Mental health diagnosis (%)	53.83	55.81	49.29
VA outpatient cost in 365 days prior (\$)	12,371	12,916	11,070
VA inpatient cost in 365 days prior (\$)	26,937	29,660	20,049
Rurality (%)	11.13	10.01	14.03

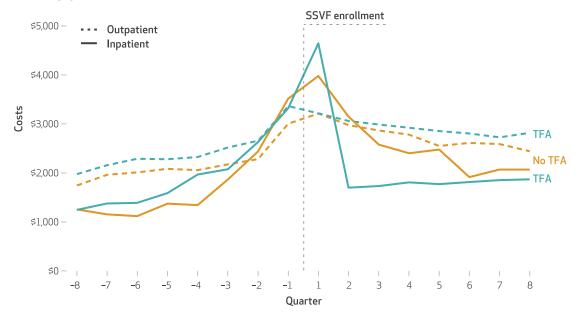
SOURCE Authors' analysis of Department of Veterans Affairs (VA) data from the cohort of SSVF enrollees, fiscal years 2016–18. **NOTES** SSI is Supplemental Security Income. SNAP is Supplemental Nutrition Assistance Program. HUD-VASH is Department of Housing and Urban Development–VA Supportive Housing. GPD is Grant and Per Diem Program.

nents of the Supportive Services for Veteran Families program. As seen in online appendix exhibit 1,²¹ 69.5 percent of veterans enrolled in SSVF received temporary financial assistance, and the mean amount of that assistance received in both components was roughly \$6,000. Those in the rapid rehousing component of the SSVF program received slightly more on average than those in the homelessness prevention component. Recipients can receive temporary financial assistance for multiple categories, which is why the means for the type of assistance sum to more than 100 percent in the exhibit. The two most frequent uses were rent and security deposits, which occurred in approximately 40 percent of observations.

Mean health care costs by quarter for SSVF enrollees who did and did not receive temporary financial assistance during their episode are graphed in exhibit 2 for inpatient costs for veterans in the rapid rehousing component of the program and for outpatient costs for veterans in the homelessness prevention component. Appendix exhibit 2 is a similar figure for outpatient costs for veterans in the rapid rehousing component and inpatient costs veterans in the homelessness prevention component.²¹ For all veterans, health care costs increased sharply in the quarters leading up to SSVF enrollment. This was especially true for outpatient and inpatient costs for those in the rapid rehousing component and outpatient costs for those in the homelessness prevention component. The regression to the mean that occurs once people enter the program highlights the importance of using longitudinal data and a comparison group to answer this research question. The similarities in these pre-SSVF enrollment levels and trends in health care

EXHIBIT 2





SOURCE Authors' analysis of Department of Veterans Affairs (VA) data from cohort of SSVF enrollees, fiscal years 2016–18. **NOTES** Outpatient costs are included only for veterans enrolled in the homelessness prevention component of the SSVF program. Inpatient costs are included only for veterans enrolled in the rapid rehousing component of the SSVF program. TFA is temporary financial assistance.

costs suggest that veterans who did not receive temporary financial assistance are an appropriate comparison group for veterans who received that assistance.

In multivariable regression analyses, the key independent variable was the interaction between the temporary financial assistance and post-SSVF period dummy variables (exhibit 3

and appendix exhibit 3).²¹ We report results for the three groups (full sample, rapid rehousing only, and homelessness prevention only) and three outcomes (total health care, inpatient, and outpatient costs). Total health care costs per quarter decreased (–\$352; 95% confidence interval: –485, –219) for veterans receiving temporary financial assistance after enrollment in

EXHIBIT 3

Relationship between receipt of temporary financial assistance and health care cost outcomes among veterans enrolled in Supportive Services for Veteran Families (SSVF)

	Effect (\$)			
Samples	Total costs	Inpatient costs	Outpatient costs	
Overall $(N = 664,045)$	-352****	-372****	20	
Rapid rehousing only $(n = 421,703)$	-457****	-532****	75**	
Homelessness prevention only $(n = 208.768)$	-219**	_117	-103**	

SOURCE Authors' analysis of Department of Veterans Affairs (VA) data from cohort of SSVF enrollees, fiscal years 2016–18. **NOTES** The effects reported here are the marginal effects from the interaction between the temporary financial assistance and post-SSVF period dummy variables. Multivariable mixed effects linear regression models with random effects for the veteran and quarter included the following covariates: demographic variables (age, sex, presence of spouse or partner, presence of children, and race), socioeconomic status (total monthly income, education, employment, number of times the veteran was homeless in the previous three years), indicators for the type of income (earned, Supplemental Security Income, VA disability, and other), indicators for publicly funded benefit programs (Supplemental Nutrition Assistance Program and other benefits), health insurance variables (Medicaid, Medicare, VA health care, and other health insurance), indicators for enrollment in other VA homelessness programs (Department of Housing and Urban Development–VA Supportive Housing vouchers, Grant and Per Diem Program, and other programs), Charlson Comorbidity Index, mental health diagnoses, VA health care costs in the 365 days before the index date, rurality, fiscal year of the SSVF episode, indicators for other SSVF services received, ZIP code Area Deprivation Index, and indicator for grantee. **p<0.05*****p<0.001

SSVF. The magnitude of this decrease was larger for those in the rapid rehousing component (-\$457; 95% CI: -631, -283) compared with those in the homelessness prevention component (-\$219; 95% CI: -425, -12). For veterans enrolled in the rapid rehousing component, this decrease in health care costs was driven by inpatient costs (-\$532; 95% CI: -690, -374), whereas it was driven by outpatient costs for those in the homelessness prevention component (-\$103; 95% CI: -192, -14).

In separate models, we removed the post-SSVF × temporary financial assistance treatment effect and replaced it with two sets of dummy variables: one interacts the post-SSVF dummy with indicators for the temporary financial assistance amount, and another interacts the post-SSVF dummy with indicators for the type of temporary financial assistance. The decrease in total health care costs was seen regardless of the amount of temporary financial assistance received, as seen in exhibit 4 and appendix exhibit 4 for all SSVF veterans,21 ranging from -\$381 (95% CI: -665, -97) for those receiving less than \$2,000 to -\$559 (95% CI: -888, -229) for those receiving between \$2,000 and <\$4,000. This was also true for inpatient costs. Temporary financial assistance specifically for rent was associated with a decrease in outpatient costs (-\$329; 95% CI: -433, -225), whereas security deposit (\$300; 95% CI: 208, 393) and other (\$179; 95% CI: 91, 266) temporary financial assistance were associated with increases in outpatient cost (exhibit 4).

For veterans enrolled in the rapid rehousing component of SSVF, temporary financial assistance led to decreases in inpatient health care costs ranging from -\$533 (95% CI: -887, -178) for those receiving less than \$2,000 in temporary financial assistance to -\$816 (95% CI: -1,213, -420) for those receiving between \$2,000 and <\$4,000 (see appendix exhibit 5).²¹

Finally, appendix exhibit 6 shows that veterans enrolled in the homelessness prevention component of SSVF who received less than \$2,000 in temporary financial assistance had an average decrease in outpatient cost of \$290 (95% CI: -514, -66), and those receiving between \$2,000 and <\$4,000 had an average decrease in outpatient cost of \$337 (95% CI: -\$646, -\$29).²¹

Regression results using veteran and quarter fixed effects were nearly identical to those using random effects.

Discussion

Our results indicate that the roughly 70 percent of Supportive Services for Veteran Families enrollees who, in obtaining non-VA benefits (for example, legal assistance, credit counseling, and income), received temporary financial assistance experienced a \$2,816 decrease in health care costs in the first eight quarters after program entry ($-$352 \times 8$). Between fiscal years 2016 and 2018, the VA awarded approximately \$4,000-\$5,000 per veteran-year to SSVF grantees, which included administrative costs as well as funding for temporary financial assistance and other services. 17,22,23 Although the decreases in health care costs identified in this study were not enough to offset the funds sent to grantees by the VA, these effects on the health care sector are only a small portion of the potential benefits

EXHIBIT 4

Relationship between amount and type of temporary financial assistance (TFA) and health care cost outcomes among veterans enrolled in Supportive Services for Veteran Families (SSVF)

	Effect (\$)		
Independent variables	Total cost	Inpatient cost	Outpatient cost
TFA amount, with interaction term × post-SSVF \$0 to <\$2,000 \$2,000 to <\$4,000 \$4,000 to <\$6,000 \$6,000 or more	-381*** -559*** -392** -519***	-341*** -584**** -323** -437***	-41 26 -67 -81
TFA type, with interaction term × post-SSVF Rent Security deposit Utilities Other	-180 202** -8 264***	149 -100 -49 86	-329***** 300***** 41 179*****

SOURCE Authors' analysis of Department of Veterans Affairs (VA) data from cohort of SSVF enrollees, fiscal years 2016–18. **NOTES** The effects reported here are the marginal effects from the interaction between the TFA amount and type variables and post-SSVF enrollment dummy variables. Multivariable mixed effects linear regression models with random effects for the veteran and quarter included the covariates listed in the notes to exhibit 3. **p < 0.01 ****p < 0.001

of programs to reduce homelessness. It was beyond the scope of this study to conduct a complete and rigorous cost-benefit analysis of temporary financial assistance expenditures; however, additional benefits that should be included in such an analysis would include decreases in non-VA health care costs, decreases in encounters with the criminal justice system, stays in an emergency shelter, and use of transitional housing and permanent supportive housing programs. Although a cost-benefit analysis of temporary financial assistance expenditures through the SSVF program would be a valuable exercise, it is important to keep in mind that producing cost savings should not be the only metric used to evaluate housing interventions.²⁴

Our results here complement those from our previous study, which showed an absolute difference of 25.3 percent in the probability of stable housing for SSVF enrollees who received temporary financial assistance compared with those who did not. Moreover, whereas prior studies have demonstrated the impact of housing interventions for people experiencing homelessness that provide ongoing, full housing subsidies matched with supportive services on health care use, the present study is one of the first to demonstrate the comparable impact on health services use of the more time-limited and less intensive forms of assistance such as temporary financial assistance provided through SSVF.

Our investigation of the cost impact of temporary financial assistance is highly relevant in the context of an increasing emphasis in federal homeless policy during the past decade on rapid rehousing programs that, similar to SSVF, provide temporary financial assistance as a core part of their service model.^{25,26} Indeed, the SSVF program is one example of a broader strategy to increase federal funding for rapid rehousing, resulting in a nearly fivefold increase in the availability of rapid rehousing between 2013 and 2019.²⁷ Our findings offer key information about the impact of this policy shift. They suggest that to the extent that temporary financial assistance is leveraged by rapid rehousing providers, the cost of expanding rapid rehousing is likely to be at least partially offset by reductions in health care costs among rapid rehousing recipients with high medical needs such as veterans. From this perspective, our results would seem to offer support for a continued and perhaps expanded policy shift toward offering this type of assistance to a larger number of households experiencing homelessness.

We also found that the relationship between health care costs and enrollment in SSVF was similar to that demonstrated in homeless shelter entrants in New York City, as shown by Dan

The findings of a reduction in inpatient costs after a housing intervention are similar to those found in other studies.

Treglia and colleagues, 28 and in inpatient admissions, ED visits, and acute care use among HUD-VA Supportive Housing recipients, as shown by Ann Elizabeth Montgomery and colleagues.²⁹ Our finding of health care costs leading up to enrollment in SSVF followed by a sharp decline was seen most dramatically in outpatient and inpatient costs for enrollees in the program's rapid rehousing component. However, a shallower spike was also seen in outpatient costs for enrollees in the homelessness prevention component. In sum, these findings suggest that the pattern observed in previous studies extends to the onset of different types of housing crises beyond those that trigger an entry into emergency shelter in the case of Treglia and colleagues²⁸ and supportive housing vouchers in the case of Montgomery and colleagues.29

Health care costs represent the value of finite resources that can be used for other purposes but also serve as a proxy for the underlying health of a person or the ability of that person to obtain health care. Because of this, the hypothesized direction of change in health care costs depends on the circumstances of the people enrolled in the intervention. Interestingly, some previous studies have shown that relative to people with stable housing, people who are facing housing instability have fewer outpatient encounters. 30-32 This may be because of transportation and scheduling challenges, 33,34 psychological impediments such as concern about refusal of care³⁵ or stigmatization³⁶ from health care providers, or simply because they prioritize other concerns (such as seeking food or shelter) over medical needs.³⁷ When people facing housing instability do seek medical care, it is often in EDs38 and inpatient settings. 5,39 This evidence suggests that housing interventions could lead to increases in outpatient care as more basic needs of food and shelter begin to be met and that as routine care is obtained through outpatient visits, this will decrease the use of emergency and inpatient

services. 40 For example, Anirban Basu and colleagues conducted a follow-up study 11 to a randomized trial 20 of a housing and case management program for homeless adults with chronic medical illnesses in Chicago, Illinois. They found that recipients of the intervention had more outpatient encounters and fewer ED visits and inpatient days. That we found decreases in both inpatient and outpatient costs after receipt of temporary financial assistance may be because the people enrolling in SSVF are newly homeless or at risk of becoming homeless rather than chronically homeless.

The findings of a reduction in inpatient costs after a housing intervention are similar to those found in other studies. In some cases, reductions in health care costs offset the cost of housing programs, leading to overall cost savings. For instance, Mary Larimer and colleagues reported on a quasi-experimental study of a housing intervention in Seattle, Washington, specifically designed for homeless people with severe alcohol problems. They found that the average net savings was \$2,449 per person per month based on reductions in health care costs. A recent systematic review of the effects of housing interven-

tions on health care utilization outcomes found that intervention groups had fewer ED visits, hospitalizations, and inpatient days. Importantly, these studies considered housing interventions that provided ongoing, full subsidies with supportive services. There has been considerably less attention to the impact of less intensive and time-limited forms of housing assistance such as temporary financial assistance, despite the proliferation of such interventions during the past decade in the United States. Our findings thus have implications for the continued development of such interventions.

Conclusion

We show that receipt of temporary financial assistance for veterans enrolled in the Supportive Services for Veteran Families program leads to a decrease in total health care spending. Whether the decline is coming from inpatient or outpatient services is a function of how the clients entered SSVF. These results can inform national policy debates regarding the proper solution to housing instability.

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